

Begin reel

#

666

reshoot

51123-65
ACCESSION NR: AP5011315
AUTHOR: Vozhdaryev, Ye. S. (Moscow)
TITLE: One application of the generalized Bio-Savart relation
SOURCE: Inzhenernyy zhurnal, v. 5, no. 2, 1965 341-344
TOPIC TAGS: helicopter lift prop, inductive velocity field, Bio-Savart relation, air compressibility, subsonic flow, aerodynamic calculation
ABSTRACT: The stated problem concerns the stationary field of inductive velocities of a helicopter lift prop in a subsonic compressible flow. The author uses a generalization of the Bio-Savart relation to represent the flow in a physical space, and analyzes both the field of inductive velocities of a lift prop and the field of velocities induced by free vortexes. He finds confirmation for the known dependence of inductive velocity, under the stated conditions, of the effect of air compressibility and performs calculations to illustrate the latter effect quantitatively. Velocities induced by bound vortexes proved negligibly small ($0.0102/R$). The author suggests that the effect of air compressibility can be ignored in calculations in the first approximation but

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L 51123-65

ACCESSION NR: AP5011321

should be considered in aerodynamic calculations at the second approximation level. The author is indebted to L. A. Simonov for useful advice, as well as to P. I. Radchenko and V. M. Kalyavkin for help with the calculations." Orig. art. has: 2 figures and 16 formulas.

ASSOCIATION: None

SUBMITTED: 02/01/64

NO REF SOV: 07

EXCL: 00

SUB CODE: AC, ME

OTHER: 070

Cord 2/2

123 456 789 1011 1213 1415 1617 1819 2021 2223 2425 2627 2829 3031 3233 3435 3637 3839 4041 4243 4445 4647 4849 5051 5253 5455 5657 5859 6061 6263 6465 6667 6869 7071 7273 7475 7677 7879 8081 8283 8485 8687 8889 9091 9293 9495 9697 9899 100101 102103 104105 106107 108109 110111 112113 114115 116117 118119 120121 122123 124125 126127 128129 130131 132133 134135 136137 138139 140141 142143 144145 146147 148149 150151 152153 154155 156157 158159 160161 162163 164165 166167 168169 170171 172173 174175 176177 178179 180181 182183 184185 186187 188189 190191 192193 194195 196197 198199 200201 202203 204205 206207 208209 210211 212213 214215 216217 218219 220221 222223 224225 226227 228229 230231 232233 234235 236237 238239 240241 242243 244245 246247 248249 250251 252253 254255 256257 258259 260261 262263 264265 266267 268269 270271 272273 274275 276277 278279 280281 282283 284285 286287 288289 290291 292293 294295 296297 298299 300301 302303 304305 306307 308309 310311 312313 314315 316317 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197 AND 2ND SUPPL. PROCESSES AND PROPERTIES INDEX

2

CS

Purification of waste water containing polynuclear aromatic hydrocarbons and the regeneration of the S from R. H. K. Bambergs and V. N. Voskresens. J. Chem. Ind. (U. S. S. R.) 10, No. 18, 31-2 (1941); Chem. Zvest. 1943, 1, 66. Polymul- sides in the waste water from the production of coal-tar dyes are decomposed by chlorination of the altered water. Up to 92% of the S is recovered and reused in the plant. H. H. Wirth

ASR-SLA METALLURGICAL LITERATURE CLASSIFICATION

STANDARD SYMBOLS

STANDARD METRIC UNIT ONE

STANDARD SYMBOLS

STANDARD METRIC UNIT ONE

1ST AND 2ND DEGREE										3RD AND 4TH DEGREE									
PROCESSES AND PROPERTIES INDEX																			
<p><i>la</i></p> <p>Purifying sewage water which contains alkali polysulfides and the recovery of their S. M. K. Bezuklets and V. N. Vynodestov. <i>J. Chem. Ind. (U. S. S. R.)</i> 18, No. 18, 31-2 (1941). Cl is passed into H_2O using Na_2S_4 to form $NaCl$ and opt. 92-7% of the S. H. H. Leicester</p> <p><i>11 A</i></p>																			
<p>450.51A METALLURGICAL LITERATURE CLASSIFICATION</p> <p>FROM DIVISION</p>																			
1ST AND 2ND DEGREE										3RD AND 4TH DEGREE									

14

GA

Treatment of waste water containing cyanides. M. K. Bezrubets and V. N. Voz'dayev. *J. Gen. Chem. Ind.* (U. S. S. R.) 18, No. 14, 17(1941); *Chem. Zvest.* 1942, 11, 2823. The water is rendered harmless by treatment with NaOCl. H. E. Wirth

ASAC-SLA METALLURGICAL LITERATURE CLASSIFICATION

ignore
previous
cards

ignore
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Cards

ignore
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Begin

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retake

6

6

7

IVANOV, Aleksandar, sanitetski potpukovnik dr; KORELJ, Marja, general-major
sanitetske sluzbe doc. dr; PALMAR, Ivan, sanitetski potpukovnik dr;
VUKS, Ljubomir, sanitetski pukovnik prof. dr.

An epidemic of food-borne streptococcal angina. Vojnosanit. pregl.
19 no. 11:752-768 N '62.

1. Higijensko-epidemioloski Odred u Beogradu Vojnomedicinska Akademija
u Beogradu, Higijenski zavod.
(STREPTOCOCCAL INFECTIONS) (FOOD POISONING)
(TONSILLITIS)

6

BC

Scattered spectra of polymorphous and isomorphous crystals. M. Vukobratovic (Acta Physicochim. U.R.S.S., 1937, 8, 11-24).—Previous work on the scattered spectra of α - (I) and β - p - $C_6H_4Cl_2$ (II) (A., 1930, 347) has been extended to the study of p - $C_6H_4Br_2$ and p - C_6H_4ClBr . Comparison of the spectra shows these last two to be isomorphous with (I). The differences observed between (I) and (II), and between all the crystals and their respective liquids, are attributable to vibrations peculiar to the mol. lattice. The latter frequencies increase with lowering of temp., in conformity with the resulting changes in vol. and elasticity. Slight differences in the true Raman spectra are observed in the transition (I) \rightarrow (II). The Raman spectrum of liquid (I) or (II) is unchanged between 60° and 165°.

F. L. U.

ASIS-55A METALLURGICAL LITERATURE CLASSIFICATION

SECTION 1										SECTION 2										SECTION 3										SECTION 4									
SUBSECTION 1										SUBSECTION 2										SUBSECTION 3										SUBSECTION 4									

SCATTERED RADIATION OF MIXED CRYSTALS. M. VUKA (Acta Physicochim. U.R.S.S., 1937, 6, 327-338).—Mixed crystals of $p\text{-C}_6\text{H}_4\text{Br}_2$ and $p\text{-C}_6\text{H}_4\text{Cl}_2$ were examined over a range of concns. For large frequencies the spectrum of each component is superposed on the other, but for smaller frequencies there is gradual transition from one component to the other. The crystals of $p\text{-C}_6\text{H}_4\text{Br}_2$ are isomorphous with the α -modification of $p\text{-C}_6\text{H}_4\text{Cl}_2$. It is impossible to obtain mixed crystals with the β -modification of $p\text{-C}_6\text{H}_4\text{Cl}_2$ if the concn. of $p\text{-C}_6\text{H}_4\text{Br}_2$ is $> 1\%$.
C. R. S.

Dispersion spectra of polymorphous and isomorphous crystals. M. P. Vuks, *J. Exptl. Theoret. Phys. (U. S. R.)* 7, 270 (1967). Dispersion spectra indicate a transformation from α to β -dichlorobenzene at 32°. No further changes in the spectrum take place up to 165°. Ordinary β -dibromobenzene and β -chlorobromobenzene are isomorphous with α - β -dichlorobenzene. The spectra of dibromo-, bromochloro- and dichlorobenzene change stepwise in the order named. In the last case the third "constant" line splits to a doublet. P. H. Rathmann

BC

Spectrum of the twilight sky. V. TCHERNIAKOV and M. VUKS (Compt. rend. Acad. Sci. U.R.S.S., 1937, 16, 77-79).—An intense emission at λ 5890 was observed in the spectra of the morning and evening twilight sky and night sky, attributed to H_2O vapour present at great heights. Owing to low dispersion in the green of the spectrograph used, the identity of a faint emission at λ 5610 in the twilight with the line λ 5677 in the night sky could not be established. R. C. M.

ASS-5LA METALLURGICAL LITERATURE CLASSIFICATION

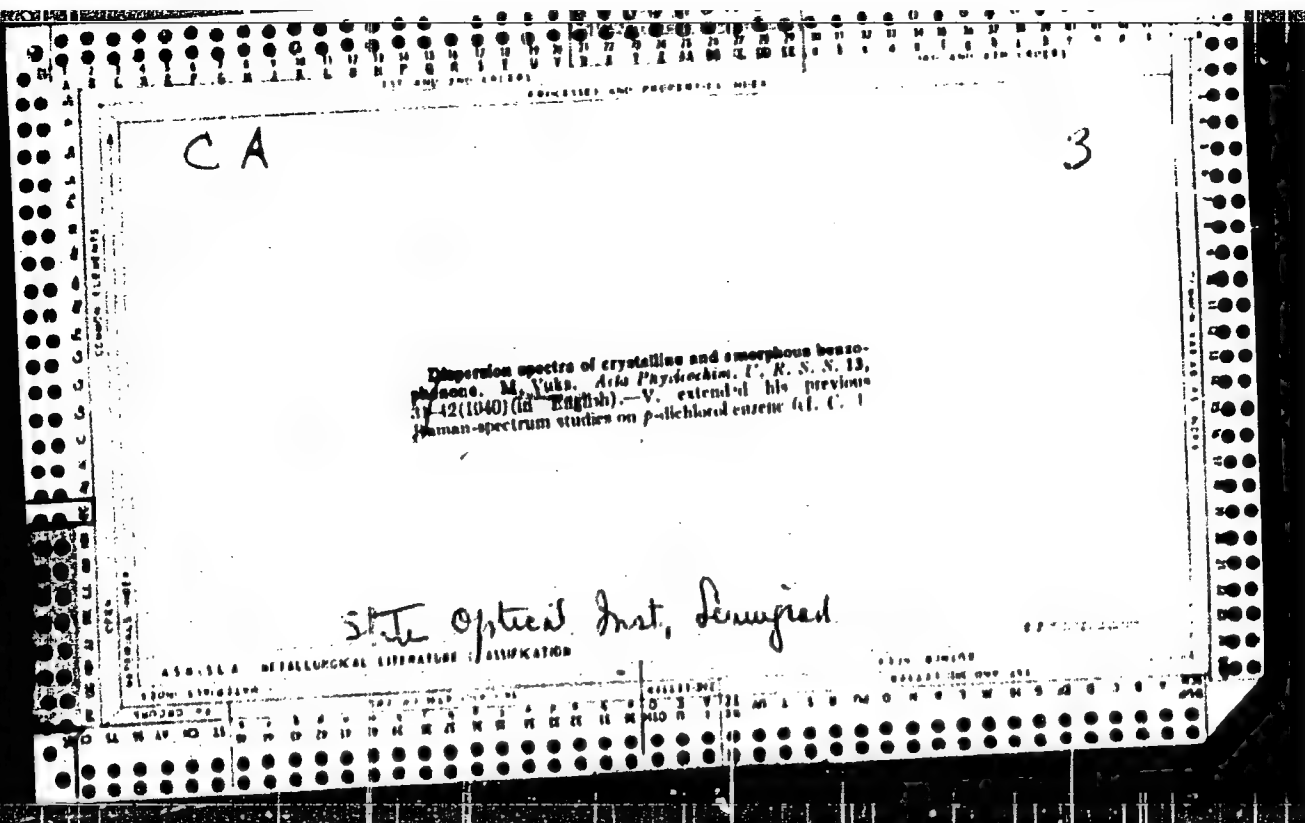
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12001 011	12001 011 011 011	12001 011	12001 011 011 011

CA

Polarization of low-frequency scattering lines by crystals. B. Grosse and M. Yuks. *J. Exptl. Theor. Phys.* (U. S. S. R.) 8, 1081 (1938); *Acta Physicochim. U. R. S. S. R.* 14(1938). -- For diphenyl ether and dibenzobenzene the coeff. of depolarization varies from $\rho_0 = 0$ to ρ_0 is greater than 1. *p*-Dibenzobenzene shows anomalous polarization when ρ is much greater than 1. F. H. Rathmann

B-1

Polarization of low-frequency lines of scattering in crystals. F. Geras and M. Vukobratovic. Physicochim. U.R.S.S., 1938, 9, 106-214. — Measurements with Pb_2O and $p\text{-C}_6\text{H}_4\text{Br}_2$ show that the low-frequency Raman lines cannot be distinguished by the state of their polarization from the ordinary vibrational lines in crystals, but the strong depolarization of the continuous spectrum in the vicinity of the Rayleigh line in liquids is explained. A case of anomalous polarization with $\rho > 1$ was observed with a crystal of $p\text{-C}_6\text{H}_4\text{Br}_2$. O. J. W.



Study of the structure of Rayleigh lines by means of resonance absorption. M. F. Yukh (Bull. Acad. Sci. U.R.S.S., *Sov. Phys.*, 1941, 8, 180-184).—The light of a Na lamp is separated into a beam which passes through a wedge, and another which is scattered by liquid CCl_4 or C_2H_2 , and the scattered part of which passes through Na vapour. If the intensities of the beams are made equal by adjusting the wedge at room temp., a temp. increase of the Na vapour reduces the intensity of the second beam. This reduction is different for unscattered light, for light scattered by C_2H_2 , and for light scattered by CCl_4 ; this shows that the fine structure of the scattered line is not identical with that of the original line and depends on the scattering liquid. Similar results are obtained with a modification of the above method. The Na vapour temp. is changed between 100° and 350°. The results permit calculation of the intensity distribution in the Rayleigh line.

J. J. H.

105. 162

New experimental data on the structure of the Rayleigh line in benzene. M. F. Vepa. (*Compt. rend. Acad. Sci. U.R.S.S.*, 1963, 22, 190—192).—Data obtained by a new method of investigating the distribution of intensity within the Rayleigh line, based on measuring the absorption of light passing through a resonance filter, are reported for C₆H₆. The calculation of the shape of the line from these data is given. N. M. H.

117 400 140 (4000)

STRUCTURE AND PROPERTIES INDEX

3

Structure of the principal scattering line and the nature of continuous radiation. M. P. Vuks (L. V. Pustovsky Inst. Phys. Chem., Kiev). *Usp. fiz. i khim. 48, 93-9; Doklady Akad. Nauk S.S.S.R. 48, 99-101 (1945).*—The intensity distribution in the Rayleigh line was studied in detail, by the resonance filter method used in an earlier paper (cf. C.A. 37, 5653). Curves for the passage of light through CS₂ (I), CCl₄ (II), hexane (III), and optical crown glass (IV) were studied. The curve for I was found roughly to resemble the benzene (V) curve. Curves for I and III differed markedly from those of I and of V in that they fell off very abruptly. The curve for IV fell off even more abruptly than that of II, but deviated appreciably from the curve for direct light. Thus, the wings near the Rayleigh line are not a unique property of the liquid and gaseous states. V. maintains that the central part of the continuous radiation, as well as the outer part, should be explained by in-termed. oscillations similar to the lattice oscillations of a crystal, the only difference being that if the outer part be-ongs to the optical branch, the central part belongs to the acoustical branch.

Frank Conet

850-566 DETALLURGICAL LITERATURE CLASSIFICATION

FROM DIVISION

117 400 140 (4000)

117 400 140 (4000)

Rotation in the Raman spectra of similar crystals and the rotational oscillation of molecules. M. Vukc (Phys.-matheysky Inst. Phys. Chem. Kiev.). *Acta Physicochim. U.R.S.S.* 20, 851-8 (1945). Low frequency Raman lines were observed for crystals of highly anisotropic mols.; this fact can be explained on the assumption that the lines originate in the rotational oscillations of the mols. in the lattice. The symmetry of the mols. is of great importance in giving rise to rotational spectra. The 3 lines observed for isomorphous crystals of *p*-bromochlorobenzene (I) and *p*-dichlorobenzene (II) as well as for other mols. with similar symmetry are due to rotation around the three symmetry axes of the mols. Crystals with ring symmetry yield only 2 lines, since rotations around figure axis are inactive. The following frequencies were observed for I: 20.1, 27.8, and 93 cm.⁻¹; for *p*-bromochlorobenzene: 22.4, 42.6, and 93 cm.⁻¹; and for II: 22.5, 42.6, 54.0, and 93 cm.⁻¹. In addn., 5 lines were observed in the spectrum of stable benzophenone (28, 42, 11, 100, and 121 cm.⁻¹) and 6 lines in the labile form (27, 45, 58, 71, 91, and 111 cm.⁻¹).

J. H. Hildebrand

Data on the structure of the fundamental line of scattering obtained by the resonator filter method. M. F. Vinka (A. V. Pisarshevskii Inst. Phys. Chem. of the Acad. Sci.). *Bull. acad. sci. U.R.S.S., Sér. phys.* 9, 1925 (1945) (in Russian).—Sodium-lamp light, after its passage through the scattering medium, is transmitted through a resonance filter consisting of Na vapor and neutral gas. The intensity of the transmitted beam is measured photometrically with varying temp. From the curve of transmission in terms of temp., the distribution curve of the intensity in terms of wave-number shift is derived by a math. method. Expts. on CaH_2 and CS_2 show the wing to be sharply sepd. from the fundamental (Raleigh) line by a distinct min., deeper for CaH_2 and somewhat shallower for CS_2 ; the min. is still broader and flatter with CCl_4 . The fractions of the total intensity corresponding to the wings are, for CCl_4 , C_2H_6 , and CS_2 , resp., $1/6$, $1/3$, and $1/5$. Following the min. right beyond the Raleigh line, the distribution curves show, in the case of CaH_2 and CS_2 , first a rise of intensity in the wing up to about $1.5 \cdot 2.0 \text{ cm}^{-1}$, a max. and then a decline of intensity. On CaH_2 , it was ascertained that, with nitrogen as the neutral gas in the resonance filter, the transmission and the intensity-distribution curves do not change when the partial pressure of the N is varied from 20 to 20 mm.; nor do they change when N is replaced by H. The described intensity distribution phenomena are related to the quasi-cryst. structure of small vol. of liquids and the resulting heterogeneities giving rise, particularly in substances with anisotropic mol., to scattering and consequent damping of Debye waves. Light scattered in the volume elements on Debye waves is incapable of interference and must appear with considerable intensity as modulated radiation adjoining the fundamental line. Distribution of intensity in the wings depends on the dimensions of the anisotropic volume elements. N. Thon

COMMON ELEMENTS		PROCESSING AND PROPERTY DATA		COMMON VARIANTS DATA	
515.375.54 - 82		302		AS-8	
<p>Some simple systems in the form of spectra of similar crystals and the relationship of molecules. Vols. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.</p>					
<p>AS-8.5.5.5 METALLURGICAL LITERATURE CLASSIFICATION</p>					
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VUKS, M. F.

PA 19/49T10

USSR/Chemistry - Rayleigh Radiation Sep/Oct 48
Chemistry - Spectra, Band

"Effect of Temperature on the Condition and Intensity
of Rayleigh's Dispersion in Liquids," M. F. Vuks,
G. P. Roshchina, D. Ye. Ovsienko, 6½ pp

"Iz Ak Nauk SSSR, Ser Fiz" Vol. XII, No 5

Presents results of investigations of intensity distribution in central part of continuous band at various temperatures. Experiments were undertaken to check accuracy of M. A. Leontovich's theory ("Jour. of Phys" 4, 499, 1941). Substances used were benzene, nitrobenzene and salol. Plots and discusses results.

19/49T10

Fluids

Experimental study of the effect of temperature on the intensity of polarized components of relay dispersion in fluids. Zhur. eksp. i teor. fiz 23, No. 1, 1952.

9. Monthly List of Russian Accessions, Library of Congress, December 1952 ~~1953~~, Uncl.

U.S.S.R.

535.435 : 535.51 : 532.

6216. Scattering of light and the orientation order in liquids. M. I. Vukobratovic, *Zh. eksper. teor. fiz.*, 24, No. 3, 351-8 (1953) in Russian.

See Abstr. 3183 (1953). A table is compiled, giving *inter alia*, the optical anisotropy (γ^2) of the vapour molecules and the effective optical anisotropy (γ_{eff}^2) of the liquid molecules for: C_2H_2 , C_2H_4 , C_2H_6 , $\text{C}_2\text{H}_5\text{Cl}$, $\text{C}_2\text{H}_5\text{Br}$, CHCl_3 , CHBr_3 , $p\text{-C}_6\text{H}_4\text{Cl}_2$, C_6H_6 , $\text{C}_6\text{H}_5\text{NO}_2$, CH_3COOH , $(\text{CH}_3)_2$, and H_2O . It has been confirmed that the optical anisotropy varies little when the substance passes from the gaseous into liquid state. The apparent anisotropy changes should be attributed to the existence of a short-range order. For some liquids (i), $\gamma_{\text{eff}}^2 < \gamma^2$, for others (ii), $\gamma_{\text{eff}}^2 > \gamma^2$. For (i) the intensity of anisotropic scattering increases together with temperature, provided $\gamma_{\text{eff}}^2 < \gamma^2$; for (ii) the intensity of anisotropic scattering falls rapidly off as temperature increases.

F. LACHMAN

RM
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VUKS, M. F.

USSR:

Dependence of the intensity of the polarized component of Rayleigh scattering of liquids on temperature. M. F. Vuk and I. G. Lukko. *Zash. Khim. i Fiz. Tverd. Tel.* 1984, 62, 1054-1057. *Sov. J. Appl. Phys.* 36A, (34-3, 1993). The intensity of the 2 polarized components of scattered light in a non-1 liquids were measured. The scattered ray, which is at 90° to the incident, is resolved into 2 polarized components, one with the elec. vector parallel to, and the other with the elec. vector perpendicular to the incident ray. The intensity of each component was investigated individually. The 1st component will depend only on the anisotropic scattering, and the 2nd is the anisotropic together with the isotropic. The liquids, chosen partly because x-ray data on their structure existed, were investigated in groups as follows: benzene, which was used as a standard, p-dichlorobenzene, p-cumylbenzene, p-dichlorobenzene, naphthalene, and diphenyl; chlorobenzene, bromobenzene, and iodobenzene; chloroform and bromoform; acetic, acetic, and butyric acids; phenylacetylene, benzophenone, p-tolyl, and nitrobenzene. The temperature dependence of the anisotropic portion of the Rayleigh scattering can increase or decrease with temp. Related liquids give similar anisotropic as isotropic scattering. It is assumed that this is due to the close packing of the molecules in the liquids.

K. L. G.

PDW

VUKS, M. F.

USSR/Physics - Solid State Physics

Nov 53

"Conference on the Liquid State of Matter, Held 22-30 May 1953 at Kiev by the Academy of Sciences, Ukrainian SSR, and Kiev State University in T. G. Shevchenko," S. D. Ravikovich, O. P. Rozhchina and I. F. Skryshevskiy

Usp Fiz Nauk, Vol 51, No 3, pp 393-405

Summarize reports by the following: V. I. Danilov, on scattering of x-rays in liquids; A. F. Skryshevskiy, on x-ray study of solns of KOH, NaOH, LiOH, LiCl, and H_2SO_4 ; Ye. A. Poray-Koshits, on integral analysis of intensity curves; P. V. Deragin, Ye. G. Shvidkovskiy, O. Ya. Samoylov et al. on x-ray studies of liquid structure; A. Z. Golik, on characteristics of molecular structure of liquids; I. V. Radchenko, on modeling of liquids; P. K. Shestakovich, on new liquid models and influence of central and dipole forces on close ordering; A. Z. Golik and his associates S. D. Ravikovich, A. V. Orishchenko, V. I. Solonko, and N. A. Ryndich, on viscosity and density of matter in the liquid state; V. M. Chulanovskiy and D. S. Karenetskaya, on the influence of molecules' size and the intermolecular intensity on viscosity coeff; A. P. Frynza, on thermo-diffusion in binary systems; S. S. Urazovskiy, presence of grouping of identical atoms; A. R. Pegel', on relation between electrical properties and structure of liquids; M. F. Vuk, on light-dispersion method for studying liquids' structure.

VUKS, M. F.

USSR/Physics - Spectral analysis

Card 1/1 Pub. 43 - 11/62

Authors : Vuks, M. F., and Bogdanov, I. A.

Title : Determination of optical anisotropy and form of certain molecules of aromatic hydrocarbons by the light diffusion in solutions

Periodical : Izv. AN SSSR, Ser. fiz. 18/6, 667-668, Nov-Dec 1954

Abstract : Experiments were conducted to determine the optical anisotropy and polarizability tensor of molecules of certain aromatic hydrocarbons having two benzene rings for the purpose of establishing the form of these molecules and the mutual orientation of the benzene rings. The hydrocarbons selected for the experiments were: diphenyl, diphenylmethane, dibenzyl, diphenyl ether, diphenylamine and benzophenone. The results obtained are shown in graphs. Four references: 3 USSR and 1 USA (1937-1953). Graphs.

Institution : The A. A. Zhdanov State University, Leningrad and the L. M. Kaganovich Military-Transport Academy

Submitted :

VUKS, M. f.

Investigation of the broadening of lines of anisotropic dispersion of light in liquids and the determination of relaxation times. M. F. Vuk and V. I. Likhov (A. A. Zhigalov State Univ., Leningrad). Doklady Akad. Nauk S.S.S.R. 103, 800-2 (1975).—Based on Likhov's quant. theory (C.A. 36, 4416³) of the anisotropic dispersion of light in liquids, the following values are given for the exptl. detn. of 7 org. liquids that show anomalous dispersion at the 5 temps. 20°, 60°, 100°, 150°, and 200°. The 7 liquids and their relaxation times expressed as $\tau \times 10^{11}$ sec., are: CS₂ (2.0-0.9); benzene (1.0-0.8); chlorobenzene (6.2-2.2); bromobenzene (7.4-2.2); benzophenone (90-4.6); nitrobenzene (110-4.5); salol (210-12). I.e. 10^{-12} - 10^{-11} sec. for the first 4 liquids (the values in parentheses are the max. and min. at the 5 temps. stated above). The values given above for chlorobenzene and bromobenzene agree satisfactorily with the values given by Hennelly, et al. (C.A. 43, 4012²). V. H. Gottschalk

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VUKS, M. F. and LITVINOV, V. L.

"Rotary Mobility of Molecules in Liquids and Solutions, and Determination of the Time of Reorientation", a paper presented at the second conference on the Liquid State of Matter, Kiev, 30 May to 3 June 1955, Usp. Fiz. Nauk, April 1955

60613, 10 f.

Determination of the time for the orientation relaxation of a number of liquids from the width of their scattering line. E. V. Vukobratovich and A. E. Atakhorshani (A. A. Zakharenko State Univ., Leningrad). Doklady Akad. Nauk S.S.S.R. 166, 921-3; Soviet Phys. "Doklady" 1, 406-7 (1956) [English translation]; J. C.A. 50, 11755a. The relaxation time was determined for a number of liquids, mostly monosubstituted benzenes. For aromatic substances, e.g. the halogen-substituted benzenes, the relaxation time increases with increasing viscosity.

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Vuk/M.F.

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1111. DETERMINATION OF THE ORIENTATIONAL RELAXATION TIME FOR A SERIES OF LIQUIDS ON THE SCATTERING LINE WITH A. E. Vukobratovic and A. K. Atak-Otmanovic. D.K. Head, J. Chem. Phys. 109, 8775 (1988).

The study of the orientational relaxation time for a series of liquids on the scattering line with A. E. Vukobratovic and A. K. Atak-Otmanovic. D.K. Head, J. Chem. Phys. 109, 8775 (1988).

Lines at 4158, 4341 and 4370 Å are used for the determination of the relaxation time. The intensity of the lines has fallen to 1/e of its initial value. The relaxation time was given by $(n-1)^2/2\pi\omega$ where ω is the width of the line where its intensity has fallen to 1/e of its initial value. $n=16$ was found to give the best results in the wings of the lines are not due to relaxation processes. About 20 liquids were studied.

A. E. Vukobratovic

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MT

VUKS, M.F.

AUTHORS: Bogdanov, I.A., Vuks, M.F. and Yelfimov, V.I. 51-4-15/25
TITLE: Determination of the optical anisotropy and the polarizability tensor of molecules from scattering of light in solutions.
(Opredeleniye opticheskoy anizotropii i tenzora
polarizuyemosti molekul po rasseyaniyu sveta v rastvorakh)
PERIODICAL: "Optika i spektroskopiya" (Optics and Spectroscopy)
1957, Vol.2, No.4, pp502-509 (U.S.S.R.)

ABSTRACT: If the refractivity (i.e. the average polarizability) and the dipole moment of molecules are preserved on solution then their polarizability tensor remains unchanged. In such cases the light scattering of solutions can be used for the study of the optical anisotropy of the solute molecules. The hypothesis of preservation of the polarizability tensor of the solute is supported by Raman and electron absorption spectra which do not change much on solution. This paper describes experimental evidence confirming this hypothesis. CS_2 , benzene and nitrobenzene were dissolved in liquids with weak anisotropic light scattering: CCl_4 , cyclohexane, heptane, ethyl alcohol ether and acetone. CS_2 was also dissolved in benzene. Concentrations of the solute were 2-30% by volume. The polarizability tensor for CS_2 , benzene and nitrobenzene is known from measurements of the Kerr constant and the light depolarization coefficient of their vapours. These molecules also possess strong optical anisotropy, conveniently

Card 1/4

51-4-15/25

Determination of the optical anisotropy and the polarizability tensor of molecules from scattering of light in solutions. (Cont.)

polarizability tensor on solution. Similar tests are carried out on monosubstituted derivatives of benzene: toluene, phenol, aniline, chlorobenzene, bromobenzene and iodobenzene. The same solvents as before were used and the solute concentrations were 4-20% by volume. Solutions of phenol and aniline in cyclohexane and in heptane, and of iodobenzene in ethyl alcohol were studied at 50°C, the rest at room temperature. Except for solutions of aniline in ether and acetone, where a noticeable solute-solvent interaction occurred, the results followed the pattern for CS₂, benzene and nitrobenzene. Solutions of paradichlorobenzene, paradibromobenzene and paradiiodobenzene (mainly in CCl₄ and benzene) were also studied. Again results similar to those for CS₂, benzene and nitrobenzene were obtained. Values of the optical anisotropy obtained from measurements for mono and di-substituted benzene were compared with those calculated on the basis of additivity of polarizabilities. These values differ considerably (up to

Card 3/4

VUKS, M. F.

AUTHOR: Vuks, M. F.

51-4-14/25

TITLE: Additivity of the polarizability tensor and the polarizability of bonds. (Additivnost' tenzora polyarizuyemosti i polyarizuyemosti svyazey).

PERIODICAL: "Optika i Spektroskopiya" (Optics and Spectroscopy) 1957, Vol.2, No.4, pp.494-501 (U.S.S.R.)

ABSTRACT: The author criticises K.G.Denbigh's (Trans.Farad.Soc.

36, 936, 1940) tables of bond polarizabilities as not very accurate. From experimental data for various compounds with the CH₂ group, for methane and ethane, the longitudinal (α_{11}) and transverse (α_{\perp}) polarizabilities of the C-H bond ($\alpha_{11} = 7.1$ and $\alpha_{\perp} = 6.2 \times 10^{-25}$ cm³) and of the C-C bond ($\alpha_{11} = 14.9$ and $\alpha_{\perp} = 0.6 \times 10^{-25}$ cm³) are calculated. Assuming the C-H ($\alpha_{11} = \alpha_{\perp} = 7.3 \times 10^{-25}$ cm³) and the N-H ($\alpha_{11} = \alpha_{\perp} = 7.4 \times 10^{-25}$ cm³) bonds to be isotropic the polarizabilities were found for the C-O ($\alpha_{11} = 13.9$ and $\alpha_{\perp} = 1.6$) and the C-N ($\alpha_{11} = 13.5$ and $\alpha_{\perp} = 2.7$) bonds. The values quoted are in units of 10^{-25} cm³. From the values of α for the C-H and N-H bonds more accurate values of the C-Cl, C-Br, C=C, C=O, C=S, C \equiv C and C \equiv N bonds were calculated. From this new table of bond polarizabilities the values of polarizabilities and of optical anisotropy of nine

Card 1/2

VUKS, M. F.

54-4-3/20

AUTHORS: Vuks, M. F., Panov, M. G.

TITLE: Investigation of the Polarization Anisotropy of Molecules of Ortho-, Meta-, and Para-Dichlorobenzenes, Dibromobenzenes, and Xylenes by Scattering of Light in Solutions
(Izucheniye anizotropii polarizuyemosti molekul orto-, meta-i paradikhlorbenzolov, dibrombenzolov i ksilolov po rasseyaniyu sveta v rastvorakh).

PERIODICAL: Vestnik Leningraskogo Universiteta Seriya Fiziki i Khimii, 1957, Vol. 22, Nr 4, pp. 14-18 (USSR)

ABSTRACT: The influence of the position of two substituents on the optical anisotropy and the polarization tensor of the above mentioned compounds is investigated. The results are compared with those of an additivity scheme. The values for dichlorobenzenes and dibromobenzenes are essentially higher than the additive ones. This phenomenon is explained by the linking of the π -electrons of halogen with the π -electrons of the benzene ring. With xylene the obtained values are somewhat lower than the additive ones. The latter is difficult to explain, but is, with reservation, ascribed to the induction effect.

Card 1/2

Investigation of the Polarization Anisotropy of Molecules 54-4-3/20
of Ortho-, Meta- and Para-Dichlorobenzenes, Dibromobenzenes,
and Xylenes by Scattering of Light in Solutions

There are 2 figures, 2 tables, and 6 references,
3 of which are Slavic.

SUBMITTED: March 27, 1957

AVAILABLE: Library of Congress

Card 2/2

ATAKHODZHAYEV, A.K.; VUKS, M.F.; LITVINOV, V.L.

Two methods for the determination of the oriented relaxation time
of molecules. Fiz. sbor. no.3:118-120 '57. (MIRA 11:8)

1. Leningradskiy ordena Lenina gosudarstvennyy universitet im. A.A.
Zhdanova.

(Light---Scattering) (Spectrum, Molecular)

24(7)

SOV/48-22-11-3/33

AUTHOR:

in Men Dok. Yuks, M. F., Nedzvetskiy, D. S.

TITLE:

Spectroscopic Observation of Rotation Mobility of Molecules in Quasi-Liquid Camphene and Tricyclene Crystals (Spektroskopicheskiye izucheniye vrashchatel'noy podvizhnosti molekul v kvazizhidkikh kristallakh kamfena i tritsiklena)

PERIODICAL:

Izvestiya Akademii nauk SSSR, Seriya fizicheskaya, 1978, Vol 22, Nr 11, pp 1302-1303 (USSR)

ABSTRACT:

So-called quasi-liquid crystals possess a series of special qualities. Investigations carried out by Gross and Raskin (Ref 1) showed that the dispersion spectra of these crystals are to a large extent similar to the spectra of the liquid phase. The methods of observation of the expansion of dispersion lines, as worked out by the authors (resonance filter method and spectrographic method (Refs 2 and 3)), made closer comparisons possible. Experimental data thus obtained permit the following conclusions to be drawn: The fact that the intensity of anisotropic dispersion varies only slightly as the melting point is passed, seems to indicate that orientational disorder in a crystal is not different from the disorder in liquids. The fact

Card 1/2

SOV/48-22-11-3/33

Spectroscopic Observation of Rotation Mobility of Molecules in Quasi-Liquid
Camphene and Tricyclene Crystals

that the width of dispersion lines is equal indicates that the rotary mobility of molecules in quasi-liquid crystals is practically the same as in liquids. These results confirm Frenkel's ideas about orientated melting in quasi-fluid crystals (Ref 5). The lack of orientational disorder in such crystals and the facility for quick re-orientation of their molecules is due to a slight anisotropy and elongation of the respective molecules. This circumstance is obvious from the very low grade of re-orientational energy of the molecules ($1,3 \div 1,5$ kilocalorie/mol) which is only two times greater than the average energy of a single degree of freedom of the oscillation movement. There are 1 figure, 2 tables, and 5 references, which are Soviet.

Card 2/2

LISNYANSKIY, L.I.; VUKS, M.F. (Leningrad)

Diffusion in nonideal solutions. Zhur. fiz. khim. 38 no.3:
645-649 Mr '64. (MIRA 17:7)

1. Leningradskiy gosudarstvennyy universitet.

VUKS, M.F.; LISNYANSKIY, L.I.; SUCHKOV, V.A.

Scattering of light in solution and other phenomena due to departures from the ideal. Ukr. fiz. zhur. 9 no.5:526-531 My '64.

(MIRA 17:9)

1. Leningradskiy gosudarstvennyy universitet.

TUKHIVATULLIN, F.Kh.; VUKS, M.F.

Orientational interaction and rotation of molecules in liquids
at high temperatures. Ukr. fiz. zhur. 9 no.5:537-540 Ky '64.
(BIRA 17:9)

1. Leningradskiy gosudarstvennyy universitet.

ROZHDESTVENSKAYA, N.B.: WUKS, M.F.

Experimental determination of the absolute intensity of light
scattering in pure liquids. Ukr. fiz. zhur. 9 no.5:544-548 My
'64. (IRA 17:9)

1. Leningradskiy gosudarstvennyy universitet.

SOV/51-4-6-8/24

AUTHORS: Atakhodzhaev, A.K., Vuks, M.F. and Plaksina, K.V.

TITLE: Broadening of the Scattering Line and the Orientational Relaxation Time of Solutions (Ushireniye linii rassseyaniya i vremya orientatsionnoy relaksatsii rastvorov)

PERIODICAL: Optika i Spektroskopiya, 1958, Vol. IV, Nr 6, pp 763-766 (USSR)

ABSTRACT: To find the relationship between the orientational relaxation time of molecules and viscosity of the medium it is usual to study solutions. Qualitative measurements, carried out in the authors' laboratory many years ago, had shown that, in certain cases, transition from the pure liquid to a solution is accompanied by broadening of the scattering line which can be observed with the naked eye. The present paper reports a more detailed investigation of this phenomenon. Five liquids with intense anisotropic scattering were chosen for this investigation; they were: hydrogen disulphide, chlorobenzene, bromobenzene, benzophenone and salol. The first three liquids possess low viscosity and produce a wide relaxational wing on scattering of light, the last two liquids possess high viscosity and produce a very narrow relaxational wing. The following liquids with weak anisotropic scattering were used as solvents: ether, ethyl alcohol, acetone,

Card 1/4

SOV/51-4-6-8/24

Broadening of the Scattering Line and the Orientational Relaxation Time
of Solutions

carbon tetrachloride, cyclohexane and heptane. Intensities of the anisotropic scattering of the liquids used as solvents are, compared with the anisotropic scattering of benzene, equal to 0.092, 0.046, 0.146, 0.060, 0.064 and 0.108 respectively. To ensure that scattering of light from the solute molecules is several times higher than the scattering from the solvent the following concentrations were used: hydrogen disulphide 10% by volume, chlorobenzene and bromobenzene 15%, benzophenone and salol 6%. Broadening of the scattering line in solutions was studied by two methods: the resonance filter method (Ref 1) and the spectroscopic method (Ref 2). Because of the small light power of the apparatus used by the authors, it was not possible to measure broadening of the scattering line of the solvents themselves. It was found in the majority of cases the relaxational wing in solutions is considerably wider than in pure liquids. The results of the experimental determination of the orientational relaxation time for molecules of hydrogen disulphide, chlorobenzene, bromobenzene, benzophenone and salol in solutions are given in Tables 1-3 which also contain data for pure liquids.

Card 2/4

SOV/51-4-6-8/24

Broadening of the Scattering Line and the Orientational Relaxation Time of Solutions

Benzophenone and salol were investigated only in solution in carbon tetrachloride. The results shown in the tables indicate that both the methods used give practically identical results. In solutions, as well as in pure liquids, distribution of intensity in the relaxational wing fits well the formula of M.A. Leontovich with one relaxation time. The most remarkable result obtained in the work is the almost complete independence of the orientational relaxation time of solvent viscosity. This almost complete departure from the Debye's formula which gives the relationship between the orientational relaxation time of molecules and solvent viscosity may be explained as follows. Orientational relaxation of molecules is a rotational Brownian motion and, in contrast to the translational Brownian motion, it does not involve the forces between the solvent molecules and, therefore, does not depend much on solvent viscosity. The tables show that the relaxation times for all solutions, except the solutions of hydrogen disulphide in heptane are considerably smaller than the relaxation times of pure liquids. In the case of benzophenone and salol this may be explained simply by the difference between the viscosity of solutions and pure liquids. In the remaining

Card 3/4

SOV/51-4-6-8/24

Broadening of the Scattering Line and the Orientational Relaxation Time of
Solutions

cases decrease of the relaxation time in solution may be due to the lack of such orientational order around the dissolved molecules as that which exists around each molecule of a pure substance. Departure from the orientational order in solution makes re-orientation of molecules easier than in pure substances. There are 3 tables and 2 Soviet references.

ASSOCIATION: Leningradskiy Gosudarstvennyy Universitet, Fizicheskiy Institut
(Leningrad State University, Physics Institute)

SUBMITTED: June 7, 1957

Card 4/4

AUTHORS: Vuks, M.F. and Atakhodzhaev, A.K.

SOV/51-5-1-9/19

TITLE: Spectroscopic Determination of the Orientational Relaxation Time of Molecules in Liquids at High Temperatures (Spektrskopicheskiye opredeleniye vremeni orientatsionnoy relaksatsii molekuly v zhidkostyakh pri povyshennykh temperaturakh)

PERIODICAL: Optika i Spektroskopiya, 1952, Vol 5, Nr 1, pp 51-56 (USSR)

ABSTRACT: The results are given of an experimental study of broadening of the scattering lines and calculation of the orientational relaxation time for a number of liquids in a wide range of temperatures. The authors used the photometric method described earlier (Refs 2, 3), with certain small refinements, to measure broadening of the scattering lines. The method of calculation of the relaxation time from the line broadening is described in the present paper. 23 organic liquids (such as hydrogen disulphide, benzene, pyridine, toluene, etc.) were studied at temperatures from 20-200°C, with the exception of nitrobenzene and styrene which were studied only at room temperature (table 1). Fig 1 shows the exciting and scattered light spectra for benzene at 28 and 203°C. Figs 2-5 show the dependences of the

Card 1/3

SOV/51-5-1-9/19

Spectroscopic Determination of the Orientational Relaxation Time of Molecules in Liquids at High Temperatures

relaxation time (τ) on the reciprocal of the absolute temperature ($1/T$) for 16 of the 23 liquids studied. With the exception of benzaldehyde, acetophenone and methyl benzoate, the experimental points lie on straight lines. This means that the dependence of the relaxation time on temperature is given by the formula $\tau = \tau_0 \exp(U/kT)$ where τ_0 is the half period of rotational oscillations and U is the activation energy. Linear dependence was also obtained for benzophenone and salol. For aniline, phenol, benzyl alcohol, benzaldehyde, acetophenone and methyl benzoate a departure from linearity is observed at temperatures above 80°C. In similar substances the same dependence of τ on T is observed, for example in toluene and ethyl benzene. Table 1 gives the relaxation times at 20 and 200°C, the activation energies and the values of τ_0 . The relaxation times can be calculated theoretically using Debye's formula $\tau = \eta_M/kT$ where η_M is the volume of a molecule and η is the viscosity of a liquid. The results of such theoretical calculations

SOV/51-5-1-9/19

Spectroscopic Determination of the Orientational Relaxation Time of Molecules
in Liquids at High Temperatures

of the relaxation times are given in Table 2. Comparison of Tables 1 and 2 shows that the calculated relaxation time is always greater than the experimental value. A further departure from Debye's formula is found in the absence of proportionality between τ and η/T when the liquid temperature is altered. In many cases proportionality between τ and η is observed. There are 5 figures, 2 tables and 5 Soviet references.

ASSOCIATION: Leningradskiy gosudarstvennyy universitet, Fizicheskiy institut
(Leningrad State University, Physics Institute)

SUBMITTED: June 7, 1957

Card 3/3 1. Organic liquids - Molecular rotation 2. Molecular rotation -
Spectra 3. Molecular rotation - Temperature factors
4. Photometry - Applications

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Abstracts book 5531. Octoloviz izdatel'stvo nauk		
Terminologiya i stroynaya raznyy (study sovetskimi... (Terminology and Structure of Solutions) Instructions of the Committee No. 1, 1958. Moscow, izdatel'stvo AN SSSR, 1959. 533 p. 1,000 copies printed.		
K. I. K. I. Shadrin, Doctor of Chemical Sciences; Ed. of Publishing House N. O. (Izdatel'stvo) Tekh. Na. I. V. Polymers.		
BOOKS: This book is intended for physicists, chemists, and chemical engineers.		
OKSOLIN, M. A. This collection of papers was originally presented at the Conference on Thermodynamic and Structure of Solutions sponsored by the Section of Chemical Sciences of the Academy of Sciences, USSR, and was held on January 27-30, 1958, Officers of the USSR, and was held in the Moscow State University. and held in the Moscow State University. A list of other reports submitted at the conference, but not included in this book, is given. Among the problems treated in this book are: electrolytic solutions, ultrasonic measurements, dielectric and thermodynamic properties of various liquids, spectro- scopic analysis, etc. References accompany individual articles.		
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L 05808-67

ACC NR: AR6031874

the first-order equation but not by the second-order equation (see ref. 6D787).
[Translation of abstract]

SUB CODE: 20/

Card 2/2 *boh*

BOGDANOV, I.A.; VUKS, M.F.

Use of method of light scattering in solutions in determining
the optical anisotropy and geometrical shape of molecules.
Vest. LGU 20 no.16:46-57 '65. (MIRA 18:9)

VUKS, M.F.; TUKHVATULLIN, F.Kh.

Studying the shape and internal mobility of molecules from the
broadening of the scattering line. Zhur. prikl. spekt. 2 no.3;
277-279 Mr '65. (MIRA 18:6)

VUKS, M.F.; ROZHDESTVENSKAYA, N.B.

A new determination of the light scattering constant using benzene.
Dokl. AN SSSR 147 no.3:573-575 N '62. (MIRA 15:12)

1. Leningradskiy gosudarstvennyy universitet im. A.A. Zhdanova.
Predstavleno akademikom A.A. Lebedevym.
(Light-Scattering) (Benzene)

VUKS, M.F.; LISNYANSKIY, L.I.

Excess absorption of ultrasound in solutions and its relations
with diffusion and fluctuations of concentration. Akust. zhur. 9
no.1:23-27 '63. (MIRA 16:5)

1. Leningradskiy gosudarstvennyy universitet.
(Absorption of sound) (Light--Scattering) (Diffusion)

VUKS, M.F.; CHERNYAVSKAYA, I.A.

Broadening of the scattering line in alcohols and affine homologous series and its relation to the scattering of electromagnetic waves. Vest.LGU 17 no.22:45-51 '62. (MIRA 15:12)
(Hydrocarbons) (Alcohols)
(Electromagnetic waves—Scattering)

S/046/63/009/001/004/026
B104/B186

AUTHORS: Vuka, M. F., Lisnyanskiy, L. I.

TITLE: Additional absorption of ultrasound in solutions and its relation to fluctuations in concentration and to diffusion

PERIODICAL: Akusticheskiy zhurnal, v. 9, no. 1, 1963, 23-27

TEXT: In this review article results of Soviet and non-Soviet papers published between 1926 and 1960 are discussed. Comparison is made between the additional absorption curve of ultrasound and the diffusion rate. It is shown that the maxima of ultrasound absorption correspond to maxima of light scattering and to minima of the diffusion coefficient. This indicates that the additional ultrasound absorption in stratified and non-stratified solutions is closely connected to fluctuations of concentrations and diffusion rate. It is assumed that this results from relaxation of the fluctuations in concentration. There are 2 figures and 23 references.

ASSOCIATION: Leningradskiy gosudarstvennyy universitet (Leningrad State University)

Card 1/2

Additional absorption of ...

S/046/63/009/001/004/026
B104/B186

SUBMITTED: March 2, 1962

Card 2/2

TUKHVATULLIN, F.Kh.; VUKS, M.F.

Rotational mobility and form of molecules. Ukr.fiz.zhur. 7
no.7:760-762 J1 '62. (MIRA 15:12)

1. Leningradskiy universitet.
(Molecular rotation)

LISNYANSKIY, L.I.; VUKS, M.F.

Light scattering in solutions and its relation to diffusion
and the absorption of ultrasound. Ukr.fiz.zhur. 7 no.7:778-
781 J1 '62. (MIRA 15:12)

1. Leningradskiy universitet.
(Light-Scattering) (Absorption of sound)
(Diffusion)

ATAKHODZHAYEV, A.K.; VUKS, M.F. —

Reorientation of molecules in liquids and comparison of the
relaxation times. Ukr.fiz.zhur. 7 no.7:762-768 J1 '62.

(MIRA 15:12)

1. Samarkandskiy universitet i Leningradskiy universitet.
(Molecular rotation) (Liquids)

S/843/62/000/000/002/01C
D207/D308

AUTHOR: Vuks, N.P.

TITLE: Relationship between rotational mobility of molecules and viscosity

SOURCE: Stroyeniye i fizicheskiye svoystva veshchestva v zhidkom sostoyanii; materialy IV soveshch. po probl. zhidkogo sost. veshchestva, v Kiyevе 1959 g Kiev, Izd-vo Kiev. univ., 1962, 11-14

TEXT: Measurements of the anisotropy relaxation time of liquids, carried out by the author together with A.K. Atakhodzhaev and V.I. Litvinov, showed that the Debye formula relating the relaxation time and the viscosity of liquids is not obeyed by very viscous liquids with intermolecular hydrogen bonds and by liquids with nearly spherical molecules. Measurements of the relaxation time τ and of the viscosity η of twenty organic liquids, carried out at 20 - 200°C by the author together with A.K. Atakhodzhaev, showed that $\tau = \tau_0 e^{U_{rot}/RT}$ and $\eta = \eta_0 e^{U_{visc}/RT}$, where U_{rot} and U_{visc} are

Card 1/2

Relationship between rotational ...

S/843/62/000/000/002/010
D207/D308

the activation energies for molecular rotation (reorientation) and translation respectively. For 13 out of 20 liquids it was found that $U_{rot} = U_{visc}$; for 3 liquids $U_{rot} = U_{visc}$ above 70°C. For the remaining 4 liquids (benzene, pyridine, toluene, ethyl benzene) $U_{rot} < U_{visc}$ at all test temperatures. It is concluded that for the majority of the tested liquids the potential barriers opposing rotation and translation are equal or nearly equal; rotation accompanies translation and both are governed by the rate of diffusion. In the case of benzene, pyridine, toluene and ethyl benzene rotation is easier than translation because molecules of these liquids are nearly spherical. There are 3 figures and 1 table.

ASSOCIATION: Leningradskiy gosudarstvennyy universitet (Leningrad State University)

Card 2/2

VUKS, M.F.; CHERNYAVSKAYA, I.A.

Dipole relaxation time and activation energy of bromides as
determined by spectroscopic measurements. Dokl.AN SSSR 145
no.3:549-550 J1 '62. (MIRA 15:7)

1. Leningradskiy gosudarstvennyy universitet imeni A.A.Zhdanova.
Predstavleno akademikom A.A.Lebedevym.
(Spectroscopy) (Bromides--Dipole moments)

S/185/62/007/007/010
I048/I248

AUTHORS: Atakhodzhayev, A.K. and Vuks, M.F.

TITLE: The reorientation of molecules in a liquid and
comparison of the relaxation times

PERIODICAL: Ukrains'kyi fizychnyy zhurnal, v.7, no.7,
1962, 762-768

TEXT: The authors compare measurements of the time of
relaxation (τ) of the molecular anisotropy in a liquid obtained
by dispersion with results obtained by widening of the scattering
lines by dynamic double refraction (these two methods are based
on the [1] M.A. Leontovich theory, J. of Physics, USSR, 4, 499,
1941). Good agreement between the results of all three methods

Card 1/2

S/185/62/007/007/007/010
IO48/I248

The reorientation of...

was obtained in the case of a large number of organic media (e.g., benzene, toluene, o,m,p-xylenes). No agreement was obtained in the case of aniline, nitrobenzene, diphenyl, and salol. The experimental error is 10% when the dispersion or widening methods are used. The validity of the expression $\tau = \frac{1}{3} \tau_{\text{dip}}$ was also examined (τ_{dip} is the time of dipole relaxation); the expression was found to be valid, within a fair range of accuracy, in the case of the majority of organic liquid studied; the most important exception was diphenyl ether for which $\tau = 18 \times 10^{-12}$ sec., while $\frac{1}{3} \tau_{\text{dip}} = 2.6 \times 10^{-12}$ sec. These differences are related to the non-rigidity of the molecules or to the superposition of dispersion effects on the usual orientation effect. ✓

ASSOCIATION: *Samarkandskiy universitet, Leningradskiy universitet*
(University of Samarkand and University of Leningrad)

Card 2/2

S/185/62/007/007/008/010
I048/I248

AUTHORS: Lisnyanskiy, I.I. and Vuks, M.F.

TITLE: The scattering of light in solutions and its
relation to diffusion and ultrasonic wave absorption

PERIODICAL: Ukrains'kyi fizychnyy zhurnal, v.7, no.7,
1962, 778-781

TEXT: The Gibbs excess molar potential G^E is a qualitative measure of fluctuations in the concentration of the components of a solution, and its value at the limit of stability of the solution, is about 300 cal./mole. Large concentration-induced scattering of light is to be expected in all cases in which G^E approaches 300 cal./mole. The maximum scattering does not necessarily corres-

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S/185/62/007/007/008/010
IO48/I248

The scattering of light in...

pond to the maximum fluctuations in concentration, i.e., to the minimum value of $\partial^2 G / \partial x_1^2$ where G is the Gibbs molar thermodynamic potential and x_1 is the molar concentration of the first component of the solution; since $\partial \epsilon / \partial x_1$, where ϵ is the optical dielectric permeability, and which is one of the factors affecting the Rayleigh scattering constant, is itself a function of the concentration. In the system acetone-water the minimum $(\partial^2 G / \partial x_1^2)_T$ is at 50% acetone while the maximum scattering is at 10% acetone (all percentages are molar). Generally, the scattering intensity decreases with heating. As the value of $\partial^2 G / \partial x_1^2$ affects the rate of diffusion too, the scattering intensity is closely related to the coefficient of diffusion of the system, both one-phase and two-phase binary systems. For the system methanol (or ethanol, or propanol, or tert. butanol) - water, the absorption of ultra-

Card 2/3

S/185/62/007/007/008/010
IO48/I248

The scattering of light in...

sonic waves in a solution is related to the fluctuations in concentration and the rate of diffusion, although the maximum absorption does not necessarily correspond to maximum scattering or minimum diffusion. There are 3 figures. ✓

ASSOCIATION: Leningradskiy universitet (University of Leningrad)

Card 3/3

VUKS, M. I.

STRUCTURE AND PHYSICAL PROPERTIES OF MATTER IN A LIQUID STATE
reports read at the 4th Conference convened in KIEV from 1 to 5 June
1959, published by the publishing House of KIEV University, KIEV,
USSR, 1962

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LISNYANSKIY, I.I.; VUKS, M.F.

Effect of fluctuations in concentration and of the stability
of a solution on the scattering of light and other phenomena.
Vest. LGU 17 no.4:67-72 '62. (MIRA 15:3)
(Ligh--Scattering)(Solution(Chemistry))

VUKS, M.F.

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PHASE I BOOK EXPLOITATION SOV/5469

Soveshehaniye po kriticheskim yavleniyam i flyuktuatsiyam v rastvorakh. Moscow, 1960.

Kriticheskiye yavleniya i flyuktuatsii v rastvorakh; srudy soveshehaniya, yanvar' 1960 g. (Critical Phenomena and Fluctuations in Solutions; Transactions of the Conference, January 1960) Moscow, Izd-vo AN SSSR, 1960. 190 p. 2,500 copies printed.

Sponsoring Agencies: Akademiya nauk SSSR. Otdeleniye khimicheskikh nauk. Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova. Khimicheskii fakul'tet.

Responsible Ed.: M. I. Shakhparonov, Doctor of Chemical Sciences, Professor; Ed. of Publishing House: E. S. Dragunov; Tech. Ed.: S. G. Tikhonirova.

PURPOSE : This collection of articles is intended for scientific personnel concerned with chemistry, physics, and heat power engineering.

Card 1/9

3c

Critical Phenomena and Fluctuations

NOV/5469

COVERPAGE: The book contains 24 of the 26 reports read at the Conference on Critical Phenomena and Fluctuations in Solutions organized by the Chemical Division of Moscow State University, January 26-28, 1960. The reports contain results of investigations carried out in recent years by Soviet physicists, chemists, and heat power engineers. The Organizing Committee of the Conference was composed of Professor Kh. I. Amirkhanov, A. Z. Golik, I. R. Krichevski (Chairman), V. K. Semenchenko, A. V. Storonkin, I. Z. Fisher, and M. I. Shakhparonov (Deputy Chairman). References accompany individual articles.

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Critical Phenomena and Fluctuations

SOV/5469

Akhadov, Ya. Yu., and M. I. Shakhparonov [Laboratoriya fiziko-khimii rastvorov, Khimicheskii fakul'tet, Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova -- Laboratory of the Physical Chemistry of Solutions, Chemistry Division, Moscow State University imeni M. V. Lomonosov]. Dielectric Properties of Solutions in a Superhigh Frequency Field and Concentration Fluctuations

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Critical Phenomena and Fluctuations

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Shimanskaya, Ye. T., Yu. I. Shimanskiy, and A. Z. Golik [Laboratory of Molecular Physics, Division of Physics, Kiev State University imeni T. G. Shevchenko]. Investigation of the Critical State of Pure Substances by Topley's Method

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AVAILABLE: Library of Congress (QD545.S73)

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Card 9/9

VUKS, M.F.

Components of the polarizability tensor for the double bonds $\text{C}=\text{C}$
and $\text{C}=\text{O}$. Opt. 1 spektr. 8 no.6:877-878 Ju '60. (MIRA 13:8)
(Chemical bonds)

VUKS, M.F.

Comparison of the activation energy for the reorientation
of molecules with the activation energy of viscous flow.
Opt.1 spektr. 9 no.1:92-94 J1 '60. (MIRA 13:7)
(Force and energy) (Viscosity)

80560

S/051/80/008/08/021/024
E201/E691

514130

AUTHOR: Vuka, M.F.

TITLE: The Components of the Polarizability Tensor of the Double Bonds
C=C and C=O

PERIODICAL: Optika i spektroskopiya, 1960, Vol 8, Nr 6, pp 877-878 (USSR)

ABSTRACT: The polarizability tensor of double bonds is always assumed to be axially symmetrical, although this is not always true. The present note describes the method of calculation and gives actual results for all three principal components of the polarizability tensor of the C=C and C=O bonds. It was found that the polarizability of these two double bonds does not depart greatly from axial symmetry. The paper is entirely theoretical. There are 4 references, of which 1 is Soviet, 1 English, 1 German and 1 international (Acta Crystallographica).

SUBMITTED: November 3, 1959

Card 1/1

VUKS, M.P.; PANOV, M.G.

Investigating the optical anisotropy of molecules of ortho-, meta- and paradichlorobenzene, dibromobenzene, and xylene by scattering of light in solutions [with summary in English]. Vest. LGU 12 no.22: 14-18 '57. (MIRA 11:2)

(Benzene--Optical properties)
(Xylene--Optical properties)
(Light--Scattering)

VUKSAN, A.

Tanks in the defense of inhabited places. p. 26. (VOJNA GLASNIK, Vol. 6, no. 6, June 1954, Beograd, Yugoslavia)

SQ: Monthly list of East European Accessions, (EEAL), LC, Vol. 4, no. 1 Jan. 1955, Uncl.

VUKSAN, Nada, inz. arh. (Beograd, Admirala Goprata 10)

Where does the architectural designing actually belong? Tehnika Jug
17 no.9: Suppl. Gradevinarstvo 16 no.9:1678-1679 8 '62.

1. Visi strucni saradnik Instituta za ispitivanje materijala NR
Srbije.

VUKSAN, Nada, inž. arh. (Beograd, Admirala Geprata 10).

Flat roofs and terraces. Tekhnika Jug 17 no.12:2262-2267 D '62.

1. Visi strucni saradnik Instituta za ispitivanje materijala
NR Srbije.

TOMASEGOVIC, Z.; JANKOVIC, Z.; PETKOVIC, V.; STANIC, M.; BETLHEIM, S.; BLAZEVIC, D.; PERSIC, N.; ZCRINC, S.; TEODOROVIC, B.; VRANCIC, J.; VODOPLJA, I.; ANTONIAZZO, Z.; CULIC, R.; GALINOVIC, WEIEGLASS, M.; RADANOV, Z.; MRAVUNAC, B.; KOEHLER-KUBELKA, N.; CEZNER, M.; KOHN, V.; TEKAVCIC, B.; EMILI, H.; SMERDEL, S.; SOOS, E.; VUKSANOVIC, V.; JANJATOVIC, M.; DERVISEVIC, I.; GRUENWALD, P.; SKRABALO, Z.; CREPINKO, I.; HAUPTMANN, E.; VIDACEK, S.; HORVAT, A.; MIOCKA, O.; IVANCEVIC, D.; PERGER, A.; KRSENJAVI, B.; PRAZIC, M.; SALAJ, B.; SUBOTIC, R.; RADOSEVIC, Z.; KELER-BAGOKA, M.; HAHN, A.; MATKOVIC, B.; RADONIC, M.

Reveiw of periodicals; medicine. Bul se Young 9 no.4/5:145-147
Ag-O '64.

VUKSANDVIC, Vicko, Dr.

The problems of immunization. Lijec.vjec. 77 no.3-4:210-216 Mar-Apr '55.

1. Iz Centralnog higijenskog zavoda u Zagrebu.
(IMMUNITY,
immunization(Ser))

VUKSANOVIC, Z.

"Organization of the fire station in military demolition."

p. 838 (Vojno-Tehnicki Glasnik) Vol. 5, no. 11, Nov. 1957
Belgrade, Yugoslavia

SO: Monthly Index of East European Accessions (EEAI) IC. Vol. 7, no. 4,
April 1958